

# **76th European Association of Geoscientists and Engineers Conference and Exhibition 2014 (Workshops)**

**Amsterdam, Netherlands  
16-19 June 2014**

**ISBN: 978-1-63266-695-6**

**Printed from e-media with permission by:**

Curran Associates, Inc.  
57 Morehouse Lane  
Red Hook, NY 12571



**Some format issues inherent in the e-media version may also appear in this print version.**

Copyright© (2014) by the European Association of Geoscientists & Engineers  
All rights reserved.

Printed by Curran Associates, Inc. (2014)

For permission requests, please contact by the European Association of Geoscientists & Engineers  
at the address below.

EAGE  
PO Box 59  
3990 DB Houten  
The Netherlands

Phone: +31 88 995 5055  
Fax: +31 30 634 3524

[eage@eage.org](mailto:eage@eage.org)

**Additional copies of this publication are available from:**

Curran Associates, Inc.  
57 Morehouse Lane  
Red Hook, NY 12571 USA  
Phone: 845-758-0400  
Fax: 845-758-2634  
Email: [curran@proceedings.com](mailto:curran@proceedings.com)  
Web: [www.proceedings.com](http://www.proceedings.com)

## TABLE OF CONTENTS

### **SESSION: WS01 - UPSTREAM GEOPHYSICS OR GEOSCIENCE**

<b>WS1-01: Improving Subsalt Imaging by Image Conditioning and Enhancement with RTM Vector Image Partitions - A GoM Case Study .....</b>	1
<i>C. Zhao, O. Zdraveva, A. Gonzalez, R. King, R. Gu, S. Chen</i>	
<b>WS1-02: Highly Detailed Reservoir Imaging by Using Sparse Layer Inversion in a Complex N.Sea Turbidite.....</b>	6
<i>D. Mann , R. van Eykenhof, J. Castagna, C. Ashton</i>	

### **SESSION: WS02 - BROADBAND SEISMIC – WHAT CAN IT DO FOR ME?**

<b>WS2-A01: Keynote Speech - Broadband Seismic - The Interpreters Dream Come True? .....</b>	11
<i>J. Lie</i>	
<b>WS2-A02: Broadband Seismic - Uplift to the Interpreter.....</b>	13
<i>N. O'Dowd, P. Carolan</i>	
<b>WS2-A03: Broadband - The Interpreter's Friend? .....</b>	16
<i>M. Francis, C. Cunnell</i>	
<b>WS2-A04: Improvements to Frequency Decomposition Methodologies for Use with Broad Bandwidth Seismic Datasets.....</b>	19
<i>J. Lowell, A. Eckersley, T. Kristensen, P. Szafian, N. McArdle</i>	
<b>WS2-B02: Benefits of Broadband Seismic Data for Reservoir Characterization - Santos Basin, Brasil.....</b>	22
<i>E. Kneller, L. Zekian, T. Coleou, J. Coulon</i>	
<b>WS2-B03: Fast Track Broadband Seismic Inversion Workflows.....</b>	25
<i>A. Geisslinger, H. Hamzah</i>	
<b>WS2-B04: Using Inversion to Estimate the Impact of Broadband Data on Elastic Property Uncertainties .....</b>	28
<i>J. Townend, A. Cherrett</i>	
<b>WS2-C01: The Benefits of Broadband Seismic Data .....</b>	31
<i>B. Krokan</i>	
<b>WS2-C02: Addressing Obstacles to Adoption of Broadband Seismic by Asset Team Interpreters.....</b>	34
<i>T. Bird, C. Reiser, E. Anderson, M. Whaley</i>	
<b>WS2-C03: Reghosted 4D and 3D Reservoir Characterization Using a Broadband Monitor on a Deep Offshore Turbiditic Field .....</b>	37
<i>C. Deplante, F. Jeanjean, V. Sebastiao, S. Sageder</i>	

### **SESSION: WS04 - SHALE CHARACTERIZATION FROM WELL DATA ANALYSIS**

<b>WS4-A01: Couy-1 Well, Paris Basin, France - An Open Window on the Toarcian Series for Organic Rich Shale Characterization .....</b>	40
<i>C. Rigollet, D. Bonijoly, A. Hofmann, M. Power, M. Simpson</i>	
<b>WS4-A02: How to Maximize Wellsite Information for Assessing Tight Hydrocarbon Opportunities.....</b>	43
<i>M. Simpson, D. Bonijoly, M. Power, C. Rigollet</i>	
<b>WS4-A03: Integrated Log-core Calibrated Approach for Petrophysical and Geomechanical Characterization of Source-rocks.....</b>	46
<i>A. Di Matteo, D. Bonijoly, M. Power, C. Rigollet, M. Simpson</i>	
<b>WS4-B01: The Role of Mineralogy (QEMSCAN) in the Facies Heterogeneity Characterization of Organic Rich Shale .....</b>	49
<i>M. Power, D. Bonijoly, A. Hofmann, C. Rigollet, M. Simpson</i>	
<b>WS4-B02: Shale Geomechanics - A Nano-indentation Application.....</b>	52
<i>M. De Block, D. Bonijoly, A. Hofmann, M. Power, C. Rigollet, M. Simpson</i>	

### **SESSION: WS05 - HARD ROCK SEISMIC IMAGING**

<b>WS5-A01: Seismic Prospecting of Geothermal Reservoirs in Hard Rock Environment - General Concept and Field Study .....</b>	55
<i>W. Rabbel, E. Szalaiova</i>	

<b>WS5-A02: 3D Focused Seismic Imaging for Geothermal Reservoir Characterization in Crystalline Rock (Schneeberg, Germany) .....</b>	58
<i>F. Hlousek, O. Hellwig, S. Buske</i>	
<b>WS5-A03: 3D Lithological and Structural Modeling of the Kevitsa 2D and 3D Reflection Seismic Data - A Case Study .....</b>	61
<i>E. Koivisto, A. Malehmir, T. Voipio, C. Wijns</i>	
<b>WS5-A04: Seismic Exploration for Volcanogenic Massive Sulphides - The DeGrussa Copper-gold Mine, Western Australia .....</b>	64
<i>J. Kinkela, S. Ziramov, A. Dzunic, M. Urosevic, P. Hilliard</i>	
<b>WS5-B01: In-Mine Seismic Imaging Revisited .....</b>	67
<i>B. Milkereit, R. Saleh, J. Huang, B. Valley</i>	
<b>WS5-B02: Direct VMS Targeting through Preserved Relative Amplitude Processed Seismic Imaging at Neves Corvo, Portugal.....</b>	70
<i>S. Yavuz, J. Kinkela, M. Penney, V. Araujo, R. Neto, A. Dzunic, M. Urosevic</i>	
<b>WS5-B03: Mineralization Indicators from Seismic and Full Wave Sonic Data in the Athabasca Basin, Saskatchewan, Canada.....</b>	73
<i>Z. Hajnal, E. Takacs, B. Pandit</i>	
<b>WS5-B04: Seismic across Different Mineral Deposits - Does It Work? .....</b>	76
<i>M. Urosevic</i>	
<b>WS5-D01: Application of Seismic Interferometry in Crystalline Rocks - A Case Study From the Lalor Mining Area, Canada .....</b>	79
<i>S. Cheraghi, J. Craven, G. Bellefleur</i>	
<b>WS5-D02: High-resolution Multicomponent Hardrock Seismic Imaging of Mineral Deposits and their Host Rock Structures .....</b>	82
<i>A. Malehmir, S. Wang, J. Lamminen, M. Bastani, C. Juhlin, K. Vaittinen, L. Dynesius, H. Palm</i>	
<b>WS5-D03: Application of Curvelet Denoising to 3D Poststack Data Acquired in Hardrock Environment .....</b>	85
<i>A. Gorszczyk, M. Malinowski</i>	
<b>WS5-D04: 3D Seismic Imaging of the Ghost-Carbon Leader Reef of the World's Deepest Gold Mine - Mponeng Gold Mine, South Africa .....</b>	88
<i>M. Manzi</i>	
<b>WS5-P01: 3D Seismic Survey in Crystalline Rocks of Saxony, Germany.....</b>	91
<i>E. Lueschen, F. Rost, G. Hoecht, R. Thomas</i>	
<b>WS5-P02: Application of the 3D CRS Workflow in Crystalline Rock Environment.....</b>	94
<i>K. Ahmed, B. Schwarz, D. Gajewski</i>	
<b>WS5-P03: Structural Characterization of a Geothermal Reservoir Using Seismic Depth Imaging Methods .....</b>	97
<i>M. Riedel, C. Dutsch, C. Alexandrakis, S. Buske, I. Dini, S. Ciuffi</i>	
<b>WS5-P04: The Use of Outcrop Analogue Basement Rocks to Help Seismic Imaging of Buried Reservoirs.....</b>	100
<i>L. Bertrand, B. Walter, G. Perry, Y. Geraud, M. Diraison</i>	
<b>WS5-P05: Volumetric Interpretation of 3D Seismic Data from the Hillside IOCG Deposit in South Australia .....</b>	103
<i>M. Hossain, M. Urosevic, A. Kepic</i>	
<b>WS5-P06: Reflection Seismic Characterization of the Grängesberg Iron Deposit and Its Mining-induced Structures, Central Sweden .....</b>	108
<i>J.A.P. Place, A. Malehmir, K. Hogdahl, C. Juhlin, K. Persson Nilsson</i>	
<b>WS5-P07: Seismic Exploration for Volcanogenic Massive Sulphides - The Rosebery Zinc, Lead, Copper Mine, Tasmania.....</b>	111
<i>J. Kinkela, A. Dzunic, M. Urosevic, R. MacRae, L. Webb</i>	
<b>WS5-P08: 3D-3C Reflection Seismic Imaging of the Lalor VSM Deposit, Manitoba, Canada .....</b>	114
<i>G. Bellefleur, E. Schetselaar, K. Miah, D. White</i>	
<b>WS5-P09: Deep Ore Exploration of Sulfides with Seismic Reflection Profiling in Outokumpu, Finland.....</b>	117
<i>S. Heinonen, S. Aatos, P. Heikkinen, N. Hellqvist, M. Kurimo, H. Leväniemi, I.T. Kukkonen</i>	
<b>WS5-P10: High Resolution Seismic Reflection for Imaging Metamorphic Rocks .....</b>	120
<i>M. Jud</i>	
<b>WS5-P11: 3D Seismic Processing of Crooked Line 2D Data in the Vicinity of the COSC 2.5 Km Deep Scientific Borehole .....</b>	123
<i>C. Juhlin, P. Hedin</i>	

<b>WS5-P12: Joining Diverse 3D Geometries in PSTM .....</b>	126
<i>S. Ziramov, M. Urosevic, J. Kinkela, A. Dzunic, M. Penney</i>	
<b>WS5-P13: Deep Shear Wave Imaging Using Cross-dipole Wireline Data .....</b>	129
<i>T. Geerits, A. Przebindowska</i>	
<b>WS5-P14: The Application of Borehole Hydrophone Arrays in Hardrock Environments .....</b>	132
<i>A. Greenwood, M. Urosevic, J. Dupuis, A. Kepic</i>	
<b>WS5-P15: Fracture Detection via Beam Imaging and Image Spectrum Analysis.....</b>	135
<i>M. Protasov, V. Tcheverda, G. Reshetova</i>	
<b>WS5-P16: Diffraction Imaging in Hard Rock Environments .....</b>	138
<i>K. Tertyshnikov, R. Pevzner, A. Bona, F. Alonaizi, B. Gurevich</i>	

## **SESSION: WS06 - SURFACE WAVE ANALYSIS**

<b>WS6-A01: Surface Wave Dispersion Analysis - From Local 1D Models to Tomography .....</b>	141
<i>L. Socco, P. Bergamo, F. Garofalo</i>	
<b>WS6-A02: Past, Present, and Future of Seismic Interferometry .....</b>	144
<i>R. Snieder</i>	
<b>WS6-A03: Probing Near Surface Shear Velocity Structure from Ambient Noise and Surface Wave Array Tomography.....</b>	147
<i>H. Yao, C. Li, X. Li, H. Fang, Y. Liu, H. Zhang, Y. Huang</i>	
<b>WS6-B01: Near-surface Full Waveform Inversion Using Surface Waves and Reflected Waves.....</b>	151
<i>I. Masoni, W. Zhou, R. Brossier, L. Metivier, S. Operto, J. Virieux</i>	
<b>WS6-B02: Challenges for 2-D elastic Full Aaveform Inversion of Shallow-seismic Rayleigh Waves.....</b>	155
<i>L. Groos, M. Schafer, S. Butzer, T. Forbriger, T. Bohlen</i>	
<b>WS6-C01: Surface-wave Analyses in Unconsolidated Granular Models with Increasing Degrees of Complexity .....</b>	158
<i>L. Bodet, P. Bergamo, A. Dhamaied, R. Martin, R. Mourges, S. Pasquet, F. Rejiba, L. Socco, V. Tournat</i>	
<b>WS6-C02: Near-surface Modelling from Surface and Guided Waves and Its Applications .....</b>	161
<i>D. Boiero, C. Strobbia, A. Zarkhidze, E. Wiarda, P. Vermeer</i>	
<b>WS6-C03: The Interpacific Project - A Cooperative Exercise for Assessing Reliability and Accuracy of Seismic Methods .....</b>	164
<i>F. Hollender, P. Bard, C. Cornou, B. Cox, S. Foti, F. Garofalo, M. Ohrnberger, D. Sicilia</i>	
<b>WS6-C04: Deriving P-wave Near-surface Models from Exploration Data.....</b>	167
<i>E. van Dedem, F. Ernst, J. Shorter</i>	
<b>WS6-P01: Effects of the Trace Interval on Surface Wave Dispersion and Inversion .....</b>	170
<i>T. Gong, H. Chen, X. Li, Y. Ye, J. Liu, H. Zhang, C. Ni, G. Ding, B. Liang</i>	
<b>WS6-P02: Multimodal Rayleigh Wave Dispersion Curve Picking and Inversion to Build Near Surface Shear Wave Velocity Models .....</b>	175
<i>D. Zheng, X. Miao</i>	
<b>WS6-P03: Surface Wave Analysis - Challenges for Application on an Ultra-shallow Structure Characterisation .....</b>	178
<i>C. Perez Solano, D. Donno, H. Chauris, G. Deidda</i>	
<b>WS6-P04: Thickness Variations in Layered Subsurface Models - Effects on Simulated MASW .....</b>	181
<i>S. Bignardi, G. Santarato, N. Abu Zeid</i>	

## **SESSION: WS07 - SHALE GEOPHYSICS**

<b>WS7-A01: Geological Setting of the Vaca Muerta Fm, Neuquen Basin - A World class Shale Play .....</b>	184
<i>M. Di Benedetto, P. Biscayart, J. Zunino, J. Soldo</i>	
<b>WS7-A04: Relationships Among Porosity, Permeability and Seismic Velocity of Shales.....</b>	189
<i>N. Mondol</i>	
<b>WS7-A05: Experimental Studies of Stress Dependence, Static vs Dynamic Behaviour and Mechanical Anisotropies of Shale .....</b>	192
<i>R. Holt, A. Bakk, A. Bauer, E. Fjaer, J. Stenebraten</i>	
<b>WS7-A06: The Effect of Shale Mineralogy on Anisotropy in Unconventional Resources Settings - A Rock Physics Modeling Study .....</b>	195
<i>R. Bachrach</i>	
<b>WS7-B01: 3D Relocation Errors of Microseismic Events by Surface and Borehole Receivers for Shale Gas Stimulation.....</b>	199
<i>H. Alsahfy, A. Vesnaver, M. Jervis, H. Kuleli</i>	

<b>WS7-B02: The Role of Geomechanics in Reservoir Stimulation Design Procedure .....</b>	204
<i>M. Slota-Valim, H. Jedrzejowska-Tyczkowska</i>	
<b><u>SESSION: WS08 - ASSET OPTIMIZATION</u></b>	
<b>WS8-02: Model-based Workflows for Optimal Long-term Reservoir Mangement .....</b>	207
<i>O. Leeuwenburgh, P. Egberts, A. Chitu, F. Wilschut</i>	
<b><u>SESSION: WS09 - CSEM: WHERE DO WE STAND AND WHERE CAN WE GO?</u></b>	
<b>WS9-A01: Marine CSEM - Where Do We Stand and Where Can We Go?.....</b>	210
<i>S. Constable</i>	
<b>WS9-A02: CSEM - Where Do We Stand and Where Can We Go? .....</b>	213
<i>S. Ellingsrud</i>	
<b>WS9-A03: Increasing Transmitter Current and Reducing Ambient Noise Levels – What Are the Limitations? .....</b>	216
<i>R. Mittet, J. Morten, H. Jensen</i>	
<b>WS9-A04: Rotate your Dipoles by 90 Degree - The Vertical CSEM Approach .....</b>	219
<i>S. Helwig, J. Borven, K. Eide, T. Holten, A. El Kaffas</i>	
<b>WS9-A05: Investigations on Small Scale Targets with Sputnik, a Two Polarization Transmitter System.....</b>	222
<i>S. Holz, A. Swidinsky, M. Sommer, M. Jegen</i>	
<b>WS9-A06: Anisotropic Inversion of Towed Streamer EM Data in Shallow Waters.....</b>	225
<i>J. Mattsson</i>	
<b>WS9-B01: Towards Real Earth Models - Computational Geophysics on Unstructured Tetrahedral Meshes? .....</b>	228
<i>C. Farquharson, P. Lelievre, S. Ansari, H. Jahandari</i>	
<b>WS9-B02: Advanced Modeling and Inversion Tools for Controlled Source EM .....</b>	231
<i>E. Haber</i>	
<b>WS9-B03: New Advances for a Joint 3D Inversion of Multiple EM Methods.....</b>	234
<i>N. Megbel, O. Ritter</i>	
<b>WS9-B04: Estimation of the Petrophysical Model through the Joint Inversion of Seismic and EM Attributes.....</b>	237
<i>F. Miotti, I. Guerra, F. Ceci, A. Lovatini, M. Paydayesh, G. Milne, M. Leathard, A. Sharma</i>	
<b>WS9-C01: Joint CSEM–seismic Evaluation of Risky Drilling Task.....</b>	240
<i>Z. He, G. Yu</i>	
<b>WS9-C02: Marine CSEM for Gas Hydrate Exploration Using a Seafloor-towed Multi-receiver System .....</b>	244
<i>K. Schwalenberg, M. Engels, D. Rippe, C. Scholl</i>	
<b>WS9-C03: Overview of Marine Controlled-Source Electromagnetic Interferometry by Multidimensional Deconvolution.....</b>	247
<i>J. Hunziker, E. Slob, K. Wapenaar</i>	
<b>WS9-C04: Recent Developments for Land-based Controlledsource Electromagnetic Surveying .....</b>	250
<i>K. Tietze, A. Grayver, R. Streich, O. Ritter</i>	
<b>WS9-C05: Advances in Electromagnetic Survey Instrumentation and the Use of a Cased Borehole for Imaging a Deep Formations.....</b>	253
<i>A. Hibbs, T. Petrov, J. Pendleton, A. Agundes, S. Kouba, T. Hall, D. Boyle, T. Martin, C. Schenkel, H. Morrison</i>	
<b>WS9-C06: Utilizing Impressed Current Cathodic Protection as the Source for Electromagnetic Exploration.....</b>	256
<i>M. Becken, T. Lindau</i>	
<b>WS9-C07: Assimilation of Time-lapse CSEM Data for Fluid Flow Monitoring .....</b>	259
<i>M. Lien, T. Mannseth, R. Agersborg</i>	
<b>WS9-C08: Hydro-frac Monitoring Using Ground Time-domain EM.....</b>	262
<i>G. Hoversten, M. Commer, E. Haber, C. Schwarzbach</i>	
<b>WS9-P01: Non Stationary, Broad-band Waveforms for CSEM - An Analysis with Synthetic Data.....</b>	265
<i>M. Neukirch, X. Garcia</i>	
<b>WS9-P02: The Prospecting Potential of Frequency and Pulse CSEM .....</b>	268
<i>P. Barsukov, E. Fainberg</i>	
<b>WS9-P03: The 3D Forward of Vertical Current Source Electromagnetic Method .....</b>	271
<i>L. Mao, X. Wang, Z. He</i>	

<b>WS9-P04: A Scalable Parallel Edge 3D Finite-element Approach to Marine Controlled Source Electromagnetic Using a Multifrontal Sol</b>	.....	274
<i>N. Zhao, X. Wang, C. Qin</i>		
<b>WS9-P06: CSEM Monitoring of a CO<sub>2</sub> Reservoir Imaged by MT</b>	.....	277
<i>V. Puzyrev, P. Queralt, J. Ledo, E. Vilamajo, A. Marcuello, J. de la Puente, J. Cela</i>		
<b>WS9-P07: Future Applications for CSEM - Shales and Monitoring</b>	.....	280
<i>K. Strack</i>		
<b>WS9-P08: Seismic-EM Integration Tackles Deep Water E&amp;P Challenges</b>	.....	282
<i>A. Zerilli, M. Buonora, P. Menezes, J. Crepaldi, T. Labruzzo</i>		
<b>WS9-P09: Industry Adoption and Use of the CSEM Technology</b>	.....	285
<i>S. Fanavoll, P. Gabrielsen</i>		

#### **SESSION: WS10 - MICROSEISMICITY AND PASSIVE SEISMIC MONITORING**

<b>WS10-A02: Development of a 3D velocity Model for Improving the Location of Potentially Induced Earthquakes in the Gulf of Valencia</b>	.....	288
<i>B. Gaite, A. Ugalde, A. Villasenor</i>		
<b>WS10-A03: Surface Microseismic Monitoring of Hydraulic Fracturing of a Shale-Gas Reservoir Using Low-Frequency Sensors</b>	.....	294
<i>H. Zhang, X. Zeng, X. Zhang, Y. Liu, Y. Zhang</i>		
<b>WS10-B02: Small Microseismic Surface Acquisition System Case Study</b>	.....	297
<i>G. Erokhin, V. Baranov, A. Kremlev, D. Gapeev, I. Smirnov, S. Rodin</i>		
<b>WS10-B03: Diffraction Stacking - The Role of Source Mechanisms</b>	.....	300
<i>O. Zhebel, D. Gajewski, C. Vanelle</i>		
<b>WS10-C02: The Application of the Microseismic Monitoring in Natural Fracture Detection</b>	.....	303
<i>C. Yin, F. Wu, Y. Li, H. Liu, G. He, C. Chen</i>		
<b>WS10-C03: Accounting for Seismic Energy Release and Fracture Surface Area Development Associated with Hydraulic Fractures</b>	.....	308
<i>T. Urbancic, A. Cochrane, A. Baig</i>		

#### **SESSION: WS11 - MULTI-PARAMETER PROCESSING AND IMAGING**

<b>WS11-A01: Auxiliary Media - A Generalized View on Stacking</b>	.....	311
<i>B. Schwarz, C. Vanelle, D. Gajewski</i>		
<b>WS11-A02: 3D Common Offset CRS for Data Pre-conditioning</b>	.....	314
<i>C. Tomas, C. Gallo</i>		
<b>WS11-A03: Prestack Signal Enhancement by Multi-parameter Common Offset MultiFocusing</b>	.....	317
<i>E. Landa, M. Rauch-Davies, K. Deev, A. Berkovich</i>		
<b>WS11-B01: Simultaneous CRS Parameters Search Based on a Non-linear Conjugate Gradient Method with Preconditioning</b>	.....	320
<i>S. Dell</i>		
<b>WS11-C01: Effective CRS Workflow for Prestack Data Regridding, Regularization, and Depth Imaging</b>	.....	323
<i>G. Eisenberg-Klein, H. Trappe, H. Endres</i>		
<b>WS11-C02: MultiFocusing Imaging for Seismic Data with Irregular Acquisition Design in Densely Populated Areas</b>	.....	326
<i>N. Elhaj, S. Rutherford, D. Gish, M. Rauch-Davies, K. Deev, D. Pelman</i>		
<b>WS11-C03: CRS Offset-azimuth Regularisation of Wideazimuth Seismic Data for Optimized Imaging and Amplitude Studies</b>	.....	329
<i>J. Pruessmann, G. Eisenberg-Klein</i>		
<b>WS11-D01: Common-Reflection-Surface (CRS) Stacking with Diffraction Moveouts of Varying Aperture</b>	.....	332
<i>J. Faccioli, T. Coimbra, M. Tygel, L. Gelius</i>		
<b>WS11-D02: Kirchhoff-type Pre-stack Time Migration Using the CRS Stacking Operator</b>	.....	335
<i>G. Garabito</i>		
<b>WS11-D03: 3D Velocity Independent Diffraction Imaging</b>	.....	338
<i>E. Bonomi, G. Caddeo, C. Tomas, P. Marchetti</i>		
<b>WS11-E01: A CRS-based Heterogeneity Attribute</b>	.....	341
<i>J. Faccioli, T. Coimbra, L. Gelius, M. Tygel</i>		

<b>WS11-E02: From Zero-offset to Common-offset with Diffractions.....</b>	344
<i>B. Schwarz, C. Vanelle, D. Gajewski</i>	
<b>WS11-E03: Gardner Continuation .....</b>	347
<i>S. Fomel</i>	

**SESSION: WS12 - GEOLOGY/ROCK PHYSICS CONTROL ON SEISMIC VTI/TTI MODEL BUILDING, WITH PARTICULAR FOCUS ON SHALE**

<b>WS12-A02: Geophysical Basin Modeling - Effective Stress, Temperature and Pore Pressure Uncertainty.....</b>	350
<i>G. De Prisco, M. Corver, I. Brevik, H. Helgesen, D. Thanoon, R. Bachrach, R. Pepper, T. Hantschel</i>	
<b>WS12-A03: Shale Anisotropy Characterization in Heterogeneous Formations Using Multipole Sonic Data.....</b>	353
<i>M. Ferla, J. Jocker, F. Pampuri, E. Wielemaker</i>	
<b>WS12-A04: Significance of Amplitude Variations in Shaley Mass-transport Deposits - A Petrophysicalgeophysical Correlation.....</b>	358
<i>T. Alves, K. Kurtev, G. Moore, M. Strasser</i>	
<b>WS12-A05: Geological Processes and Rock Physics Signatures of Upper Jurassic Organic-rich Shales, Norwegian Shelf .....</b>	363
<i>P. Avseth</i>	
<b>WS12-A06: Origin of Abnormal Pressures, Hydrodynamism and Pore Pressure Prediction .....</b>	366
<i>J. Biteau, M. Spencer, B. Benazet, C. Longis</i>	
<b>WS12-A07: Rock Physics Guided Velocity Modelling for Migration and Pore Pressure Prediction .....</b>	371
<i>B. Deo, Y. Liu, K. Ramani, N. Dutta, J. Dai</i>	
<b>WS12-B01: Geological and Rock Physics Constraints in Anisotropic Tomography.....</b>	374
<i>M. Woodward, Y. Yang, K. Osypov, R. Bachrach, D. Nichols, O. Zdraveva, A. Fournier</i>	
<b>WS12-B02: Tomographic Velocities - Challenges and Applications .....</b>	379
<i>L. Vigee, M. Bader, A. Benedini, C. Brillat, D. Carotti, A. Cavalie, T. Coleou, P. Guillaume, G. Henin, G. Lambare, T. Le Ruyet, L. Lopes, A. Vasseur, N. Vidal</i>	
<b>WS12-B03: Importance of Cross-disciplinary Constraints in Anisotropic Model Building and Updating .....</b>	382
<i>O. Zdraveva, M. Woodward, D. Nichols, K. Osypov</i>	
<b>WS12-B04: TI Model Building through Geologically Regularized Tomography .....</b>	387
<i>J. Panizzardi, N. Bienati, E. Spadavecchia</i>	
<b>WS12-B05: Upscaling in Vertically Heterogeneous TTI Models .....</b>	390
<i>A. Stovas, Y. Roganov</i>	

**SESSION: WS13 - PRACTICAL CORE INTERPRETATION FOR INPUT TO RESERVOIR MODELLING**

<b>WS13-01: Practical Core Interpretation for Input to Deterministic Facies Modelling in Wavedominated Deltaic Reservoirs .....</b>	395
<i>R. Porter, B. Bashokoo</i>	
<b>WS13-02: The Key to High Resolution Reservoir Characterization .....</b>	397
<i>G. Burmester, K. MacPherson</i>	
<b>WS13-03: Synthesis of Research and Education, Industry and Academia - A Case Study of 2-D Heterogeneities of Poroperm, Ultrasonic and Resistivity on Sub-meter .....</b>	400
<i>M. Poppelreiter, J. Hornung</i>	

**SESSION: WS14 - UNCONVENTIONAL HYDROCARBONS - INSIGHTS FROM NEAR SURFACE TECHNIQUES**

<b>WS14-A02: Multipulse Airborne TEM Technology and Test Results Over Oil-sands.....</b>	404
<i>T. Chen, G. Hodges, A. Christensen, J. Lemieux</i>	
<b>WS14-D02: Tectonic Controlled of Cleats Development as Implication of Coal Bed Methane (CBM) Prospect in the Barito Basin, South B .....</b>	407
<i>B. Sapie, A. Rifiyanto, A. Suryanugraha</i>	

## **SESSION: WS15 - FIBER OPTICS SENSING FOR VERTICAL SEISMIC PROFILE (VSP) SURVEYS**

<b>WS15-A01: Optical Multi-component Borehole Seismic Systems Continue to Deliver Unique Permanent Downhole Data .....</b>	413
<i>T. Bostick, P. Travis</i>	
<b>WS15-A02: Fiber Optic Vector Sensors .....</b>	415
<i>B. Paulsson, J. Toko, J. Thornburg, R. He</i>	
<b>WS15-B01: Distributed Acoustic Sensing for Borehole Seismic Applications .....</b>	417
<i>T. Parker</i>	
<b>WS15-B02: Case Study of a Multi-Well 4D DAS-VSP .....</b>	419
<i>D. Hill</i>	
<b>WS15-B03: Wireline Deployment of Optical VSP in Vertical and Deviated Wells .....</b>	421
<i>A. Hartog, B. Frignet, D. Mackie, M. Clarke, A. Constantinou, W. Allard, G. Lees</i>	
<b>WS15-C01: Distributed Acoustic Borehole Seismic in Producing Offshore Wells .....</b>	423
<i>K. Norgaard Madsen, M. Thompson, S. Dummong, A. Kritski, A. Petersen, D. Finfer, T. Parker</i>	
<b>WS15-C02: Distributed Acoustic Sensing (DAS) for Reservoir Monitoring with VSP .....</b>	425
<i>A. Mateeva, J. Lopez, R. Detomo, H. Potters, W. Berlang, S. Grandi, J. Mestayer, P. Wills, B. Cox, D. Kiyashchenko</i>	
<b>WS15-C03: Simultaneous Acquisition of DAS and Conventional Down-hole Geophone Array at Aquistore, Canada .....</b>	427
<i>J. Cocker, E. Herkenhoff, M. Craven, T. Nemeth, T. Daley, D. White, A. Strudley</i>	
<b>WS15-D01: DAS VSP Acquisition - Perspectives and Challenges .....</b>	430
<i>V. Lesnikov, C. Allanic</i>	
<b>WS15-D02: A Permanent Borehole Seismic Field Trial Comparing Fiber-optic Distributed Acoustic Sensing with Dedicated Geophones and Hydrophones .....</b>	432
<i>B. Hornby, Q. Li, J. Konkler, S. Soulas</i>	
<b>WS15-D03: Results of Field Testing of Simultaneous DAS and Geophone VSP .....</b>	434
<i>T. Daley, D. Miller, B. Freifeld, K. Dodds</i>	
<b>WS15-D04: 3D DAS-VSP Processing and Learning - Velocity Diagnosis and Update for Seismic Imaging Improvement .....</b>	437
<i>H. Wu, P. Wills, Y. Li, W. Wong, B. Hewett, Z. Liu</i>	
<b>Author Index</b>	